SEPTEMBER/OCTOBER 2023

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SPORT AEROBATICS
OFFICIAL MAGAZINE OF THE INTERNATIONAL AEROBATIC CLUB

CONTENTS

FEATURES

DEPARTMENTS

COVER

ON THE COVER:
Joe McMurray flies the GB1 GameBird over Bentonville, Arkansas. Photo courtesy of Joe McMurray.

ABOVE:
Jennifer Watson lands her beautiful Laser 200 at the NorCal contest. Photo by Hayman Tam.

Publisher: Jim Bourke, president@iac.org
Executive Director: Stephen Kurtzahn, execdir@iac.org, 920-426-6574
Editor: Lorrie Penner, editor@iac.org
Contributing Authors: Jordan Ashley, Jim Bourke, Keith Doyne, Lee Drumheller, Marcus Extra, Jeff Granger, Mike Heuer, Richard Johnston, Dagmar Kress, Joe McMurray, Tom Myers, Gordon Penner, Lorrie Penner, Doug Tracy, Pro-Wing Aviation Productions
Senior Copy Editor: Colleen Walsh
Copy Editors: Jennifer Knaack, Bryant Shiu
Proofreader: Tara Bann
Print Production Team Lead: Marie Rayome-Gill

IAC CORRESPONDENCE
International Aerobatic Club, P.O. Box 3086
Oshkosh, WI 54903-3086
Tel: 920-426-6574 • Fax: 920-426-6579
Email: execdir@iac.org

ADVERTISING
Advertising Manager: Sue Anderson, sanderson@eaa.org

MAILING
Change of address, lost or damaged magazines, back issues.
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Email: membership@eaa.org

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Saying Goodbye, Working Within Limits, and the IAC Website

BY JIM BOURKE, IAC 434151

Saying Goodbye to Nickolay Timofeev

I CAN'T BEGIN THIS article without communicating a heartfelt thanks and a sad goodbye to Nickolay Timofeev, who passed away in July. Nickolay was a fierce competitor during his competition days but is best known now as a coach.

I never had the pleasure of working with Nickolay as a student, but I did coach a few camps alongside him. He was a hardworking person who built strong relationships with his students. He was a coach with a method, not just someone who offered simple ground critique. Nickolay came out of the Russian system when it was at its peak. He had amazing eyes and good mechanics. He could tell his students exactly what they needed to do as he perceived every error. He had a great wit that he employed to calm students when they felt overwhelmed. I really enjoyed knowing him, and I loved watching him work.

Nickolay touched the lives of more pilots than I can count, and since his passing I've heard from many of them about what they learned from him and what they miss about him.

The loss is deeply felt by everyone on the U.S. Advanced Aerobatic Team, many of whom remember his coaching style and companionship when he coached the team in 2018. Our thanks to him and our condolences to his family. I have no doubt that some of our team members will be thinking of him and dedicating their flights to him at this year's World Advanced Aerobatic Championships.

Work Within Your Limits

Since I've spent more time coaching than flying this year, I've learned quite a bit about how other pilots think, especially new pilots. We are all different, and we all put things together in different ways. Learning everyone else's internal processes is one of the challenges and joys of teaching.

One thing that we all seem to have in common, though, is that we all seem to think we can beat the clock and find a way to learn faster than everyone else. We like to think that it just might be true that we have an innate gift, and a challenging sport like aerobatics might be easier for us than for others. We imagine that we will be able to fly at the highest levels in no time at all, as long as we burn enough fuel.

The reality is that the longer you are in the sport of aerobatics, the more you learn about the challenges and the more you can see just how much practice and feedback it takes to fly the best. This sport is *hard*. It takes *time*.

Last year I wrote the article "Roll Drills" for *Sport Aerobatics*, published in the November/December issue. I've referred to this article literally dozens of times this year. It's my belief that if a pilot has really mastered rolls, then the sport becomes much easier. There are too many people trying to cover up roll errors, even in the Advanced or Unlimited categories. Get these fundamentals in order. The best way to do this is to build up aerobatic time in an airplane like a Super Decathlon or Great Lakes.

Also, while you are building up skills, be compassionate with yourself. If you have trouble doing a figure, find a way to make it as easy as possible. Having a problem with rollers? You aren't alone! Do them big and smooth for a while. Make them smaller as you build up skill. With pretty much every figure, you can find ways to make it easier on your body and mind, and probably easier on the airplane as well. There is a time and place for flying hard, but it makes no sense to add athleticism to poor technique. Guitarists do not learn to play blistering solos by

jumping on stage, plugging in, and playing furiously with no technique whatsoever. They build up speed slowly by playing scales and arpeggios until they can do so blindfolded.

Not just in aerobatics but in everything in life, take care of yourself.

IAC Website

I'm really excited that our long-awaited new website is almost ready, and I'm hopeful it will be in place and running smoothly by the time you read this. I'm thankful to our volunteers on the IT team for their leadership on this challenging project, and I'd like to especially thank DJ Molny and Brennon York for their hard work.

The IAC website is more complicated than most because it archives so much information. During this project I dug through our archives and found a lot of interesting information in documents like the *IAC Tech Tips*. The sport has changed a lot since the early '70s, but many things will never change, and we owe it to future generations of aerobatic pilots to preserve our history.

Contest Season

As I type this, we are about halfway through our contest season. We have a lot of great engagement this year. It's a bit too early to say, but I think we've fully recovered now from the COVID period as it looks like our participation is back to its pre-COVID levels. Membership is staying strong at about 4,000 members. I look forward to seeing many of you at the IAC Nationals in Salina, Kansas, in September, and I'm always available for you at president@iac.org. IAC

The Many Aspects of Aerobatics

BY LORRIE PENNER, IAC 431036

I'M BACK HOME FOR just one day after EAA AirVenture Oshkosh as I write this, so my mind continues to play the week over and over. For me, this was one of the most fruitful trips to AirVenture I've had, and you will get the benefit of my good fortune. There will be some great stories about people and airplanes in next year's issues of *Sport Aerobatics*.

In this issue, we have an article by IAC AirVenture Chairman Jordan Ashley covering the AirVenture Award recipients. Like contests, AirVenture wouldn't run without all our volunteers pulling together to share our love of aerobatics with our members, new friends, and guests.

Nationals is right around the corner, and I can't get that out of my mind either! I am looking forward to getting back out to Salina, Kansas. If you haven't done so, take a look at all the information available about the Nationals on our website at IAC.org/Nationals. We have 50 pre-registrations, and that's about normal for two months out. We expect about 90 pilots this year, and their flights will all be broadcast again live on the IAC YouTube channel. Many of our friends and family have enjoyed this broadcast, which has reached more than 60,000 viewers. We have a great lineup of commentators, including Mike Goulian, David Martin, and Rob Holland. If you can't make it to Salina this year, I hope you tune in at YouTube.com/User/EAAIAC.

In this issue, Jeff Granger tackles the question, "Which composite monoplane would you choose?" Although some may not be in the market for a top-end composite aerobatic airplane, the concepts used by the buyers he interviewed are all questions we can ask ourselves when we have an opportunity to buy any aircraft.

Whether you have brand loyalty or an emotional connection to an airplane, I thought Joe McMurray gave an excellent list of what the choice came down to for him:

1. Emotional and visual appeal
2. Comfort
3. Performance and speed
4. Aerodynamic features
5. Fuel tank size
6. Cross-country capability

When Gordon and I bought our RV-7, for me it was about the appeal and look of the plane. I was tired of flying airplanes at our local grass field that had peeling paint and ratty seats. Yeah, they were kept meticulously tuned up by the mechanic, but it was embarrassing flying to another airport! Of course, Gordon wanted an aircraft with aerobatic capability, and he recently became interested in the possibility of flying formation with some of his RV friends. The aircraft has to fit the mission(s) you want it for.

Elsewhere, we find articles covering how to do a competition roll by Gordon Penner, and an experience and lesson from Joe McMurray on graying out. Tom Myers lets us in on "What's Bugging Me" .... you probably guessed from the title it has something to do with bugs, but I won't ruin it for you.

Whatever your interest in aerobatics, if we don't show it in the magazine, drop me a line and I will happily research or find someone who knows. Don't be shy. I'd like to hear your story, and if something aerobatic related is interesting to you, I know it will be interesting to our members. IAC

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Gone West – Nikolay Timofeev

BY PRO-WING AVIATION PRODUCTIONS

NIKOLAY TIMOFEEV WAS A beloved and well-respected aerobatic pilot, coach, and aeronautical engineer. He passed away suddenly on July 21, 2023, at age 67. His battle with a number of health setbacks in recent years showed his courage in facing life challenges head-on; he stayed strong and optimistic until the end.

Nikolay set new standards in modern aerobatics during his many appearances at air shows and competitions in Europe, North and South America, and Asia from 1992 till 2016. His numerous accomplishments include a three-time title of World Aerobatic Unlimited World Champion and a gold medal in the 1997 World Air Games. Nikolay and his family made a permanent move from Russia to the United States in 2000, where he became a much sought-after aerobatic coach.

Nikolay will always be remembered for skillfully displaying the unique aerobatic capabilities of his Su-26M, which he referred to as "my boy." His aerial aerobatic ballet became legendary, set to the classical musical masterpiece of Tchaikovsky's *Swan Lake* overture, performing maneuvers that defied imagination.

Whoever met him liked him for life. He coached to teach his students everything he knew, always giving them the best of himself. Today the aviation world, and especially the aerobatic society in Europe, America, and Brazil, is in deep mourning for the loss of one of its greatest teachers, one of its most inspiring mentors.

Nikolay's name is written in the skies forever, from where he will continue to inspire people and pilots all over the world.

Nikolay leaves behind his wife, Elena; his son, Stanislav; his daughter, Olga (Michael) Walsh; and his grandchildren, Camden Walsh and Wesley Walsh.

A celebration of life will take place later this year in his hometown of Ocala, Florida. IAC

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AEROBATIC
TEAM

Good Luck to the 2023 Advanced Team

Foreground: Alice Johnson and Jim Bourke
Left to right: Michael Lents, Marty Flournoy, Kyle Collins, Brittanee Lincoln, Marco Bouw, Matt Dunfee, and Don Hartmann

Competing at the 15th World Advanced Aerobatic Chapionship in Las Vegas, Nevada, October 24 to November 4, 2023.

Follow the team on their Facebook page: *www.facebook.com/usaadvancedaerobaticteam/*

Is That a New Contest?

THE APPEARANCE OF TWO contest names on the IAC contest listings in June may have had some volunteers and competitors asking, "Is this a new contest?" IAC chapters 38 and 78 made some changes to either their name or their location. So, not entirely new but rather reinvented. Congratulations to both the NorCal Aerobatic and Midwest Attitude Adjustment contests for successful and fun events in 2023.

NorCal, Tracy, California — Previously, IAC Chapter 38 operated its contest, the Coalinga Western Showdown, out of Coalinga, California. The chapter moved it to Tracy in 2022. Last year the name of the contest was the IAC West Open Championship, so this year they gave it a more permanent name.

The contest was held June 2-3 with a practice day on June 1 led by Contest Director Dean Hickman-Smith. Blue skies prevailed along with warm temperatures. All 40 competitors paced themselves and kept hydrated enough to complete three flights each for Primary through Unlimited power categories.

There was a plethora of judges on hand, which allowed 10 of them to judge the two Unlimited competitors. Tom Myers and Dave Watson shared the chief judge duties throughout the weekend. Thank you to all the grading judges:

A.J. Wilder	Jennifer Watson
Chris Harrison	Yuichi Takagi
Brian Branscomb	Josh Horwich
Mark King	Bret Davenport
Matthew Schulz	Benjamin Harvey
Barrett Hines	Mike Eggen
Shane Short	Ross Ferguson

An impressive 23 of the 40 pilots attending earned the Stars award (★). Stars awards are part of the IAC Achievement Awards program earned at a contest. The Smooth awards are earned at a noncontest environment.

PRIMARY POWER

PILOT		AIRPLANE	TOTAL		
★	Steven Frasier	Great Lakes 2T-1A, N4555W	1516.68	80.25%	(1)
★	Eric Ostrom	ACA Super Decathlon, N59AC	1481.38	78.38%	(2)
★	Louise Franco	Cessna 150, N9819J	1480.28	78.32%	(3)
★	Jessica Hackler	Great Lakes 2T-1A, N4555W	1456.50	77.06%	(4)
	Shelby Swartz	ACA Super Decathlon, N960DK	1368.72	72.42%	(5)
	Douglas Dawson	Christen Eagle II, N4556	1332.98	70.53%	(6)
	Michael Narodovich	ACA Super Decathlon, N64SE	1324.00	70.05%	(7)

PHOTOGRAPHY COURTESY OF **JOSHUA LAPUM**

SPORTSMAN POWER

	PILOT	AIRPLANE	TOTAL		
★	Jake Carter	ACA Super Decathlon, N59AC	3228.38	82.78%	(1)
★	Kevin Smith	Pitts Special S-2B, N62PS	3207.78	82.25%	(2)
★	Matthew Schulz	ACA Super Decathlon, N95AC	3151.70	80.81%	(3)
★	Joseph McMurray	ACA Super Decathlon, N963TT	3138.64	80.48%	(4)
★	Jennifer Watson	Laser 200, N210LL	3119.82	80.00%	(5)
	Thomas Hogan	Great Lakes, 2T-1A N4555W	2971.92	76.20%	(6)
★	Mark King	ACA Super Decathlon, N95AC	2964.76	76.02%	(7)
★	Ted Hong	ACA Super Decathlon, N910DK	2961.16	75.93%	(8)
★	Anna Zavrazhnova	Pitts Special S-2B, N92BT	2959.96	75.90%	(9)
	Dan Clarke	Pitts Special S-1E, N4UP	2914.36	74.73%	(10)
	Chris Harrison	Great Lakes 2T-1A, N60GL	2910.00	74.62%	(11)
	Luke Gray	ACA Super Decathlon, N910DK	2906.68	74.53%	(12)
	John Owens	ACA Super Decathlon, N910DK	2881.54	73.89%	(13)

INTERMEDIATE POWER

	PILOT	AIRPLANE	TOTAL		
★	Josh Horwich	Laser 230, N230DW	4952.44	81.86%	(1)
★	Brooks Mershon	Pitts Special S-1S, N69KK	4941.16	81.67%	(2)
★	Raymond Collins	Laser 200, N108CB	4939.14	81.64%	(3)
★	Bret Davenport	Pitts Special S-1SX, N360BX	4902.16	81.03%	(4)
★	Pawel Miko	Great Lakes 2T-1A, N60GL	4858.04	80.30%	(5)
★	Dean Hickman-Smith	Pitts Special S-2B, N77TW	4818.82	79.65%	(6)
	Bryan Jones	Great Lakes 2T-1A-2, N364X	4736.10	78.28%	(7)
★	Layne Lisser	Christen Eagle I, N229LL	4712.76	77.90%	(8)
	Mike Eggen	Bellanca 8KCAB Super Decathlon, N444PF	4670.16	77.19%	(9)
	Greg Savidge	Extra 260, N260EX	4586.48	75.81%	(10)
	Richo Healey	Extra 300, N111XW	4278.16	70.71%	(11)
	Shane Short	Pitts Special S-2B, N92BT	3670.10	60.76%	(12)

ADVANCED POWER

	PILOT	AIRPLANE	TOTAL		
★	Christopher Combs	Extra 330LT, N330ZZ	7763.38	82.33%	(1)
★	Tom Myers	Zivko Edge 540, N540AW	7432.62	78.82%	(2)
	Yuichi Takagi	Pitts Special S-2S, N861J	7397.34	78.44%	(3)
	Hiroyasu Endo	Velox VX35, N123VS	7160.82	75.94%	(4)
★	Barrett Hines	Extra 300, N410WB	7109.08	75.39%	(5)
	Ilya Pirkin	Giles G-200, N220DJ	6728.82	71.36%	(6)

ULTIMATE POWER

	PILOT	AIRPLANE	TOTAL		
★	A.J. Wilder	Extra 330SC, N669AJ	9748.12	75.39%	(1)
	Dave Watson	MX Aircraft MX2, N451EE	9018.20	69.75%	(2)

PHOTOGRAPHY COURTESY OF **HAYMAN TAM**

Primary 1st Gary Middlebrooks, 2nd Justin Miller, 3rd Devin Graves.


Sportsman 1st Shawn Higgins, 2nd Jonathan De Lone, 3rd Chris Lidel.


Intermediate 1st Nathan Ruedy, 2nd Justin Hickson, 3rd Chris Webber.


Advanced 1st Luke Penner, 2nd Jesse Mack with Justin Hickson.

The **Midwest Attitude Adjustment** (MWAA) in Spencer, Iowa, had been known as the Doug Yost Challenge for many years. IAC Chapter 78 is the host for this Mid-America regional contest.

The weekend of the contest was June 9-10 with a practice day on June 8. The contest director was Nathan Ruedy.

The weather, always unpredictable in the Midwest, ended up with clouds and rain drifting in and out. Primary, Sportsman, Advanced, and Unlimited were able to get in their three flights. Intermediate completed its Known and Free flights.

There were 17 competitors at MWAA, six of which were from the University of North Dakota's collegiate team. Out of the 17, more than half of the competitors, 10, earned their Stars award (★).

With a smaller contest, getting enough judges to attend can be challenging. Special thanks go out to all the grading judges, as well as Justin Hickson and Aaron McCartan, who shared the chief judge duties.

Grading judges were Dick Swanson, Luke Penner, Andrew Coughlin, Jeff Nelson, Nathan Ruedy, and Dan Pickelman.

PRIMARY POWER

PILOT		AIRPLANE	TOTAL		
★	Gary Middlebrook	Giles G-202, N6202X	1584.83	83.85%	(1)
★	Justin Miller	Pitts S-1-11, N426CU	1539.17	81.44%	(2)
	Devin Graves	ACA Super Decathlon, N318JR	1467.00	77.62%	(3)
	Tyler Sperry	ACA Super Decathlon, N318JR	1279.16	67.68%	(4)

PHOTOGRAPHY COURTESY OF **UND AEROBATIC TEAM**

SPORTSMAN POWER

PILOT		AIRPLANE	TOTAL		
	Shawn Higgins	ACA Super Decathlon, N318JR	3329.50	85.37%	(1)
★	Jonathan De Lone	ACA Super Decathlon, N318JR	3325.66	85.27%	(2)
★	Chris Lidel	Pitts S-2B, N24FF	3266.66	83.76%	(3)
	Andrew Coughlin	ACA Super Decathlon, N318JR	3258.67	83.56%	(4)
	Spencer Patterson	ACA Super Decathlon, N318JR	3067.33	78.65%	(5)
★	Helen Harmer	ACA Super Decathlon, C-FXDS	2990.77	76.69%	(6)
	Dick Swanson	Bellanca Decathlon, N8SC	2764.33	70.88%	(7)

INTERMEDIATE POWER

PILOT		AIRPLANE	TOTAL		
★	Nathan Ruedy	ACA Decathlon, N40EM	3486.84	84.43%	(1)
★	Justin Hickson	Pitts Special S-2B, N540TK	3473.67	84.11%	(2)
★	Christoph Webber	Extra 300L, C-GXRA	3245.94	78.59%	(3)
	Dan Pichelman	Laser 200, N10LM	3228.50	78.17%	(4)
	James Piros	Christen Eagle II, N31RR	3181.87	77.04%	(5)

ADVANCED POWER

PILOT		AIRPLANE	TOTAL		
★	Luke Penner	Extra 330SC, C-FXLP	7903.67	83.81%	(1)
	Jesse Mack	Extra 300L, GXRA	7416.16	78.64%	(2)

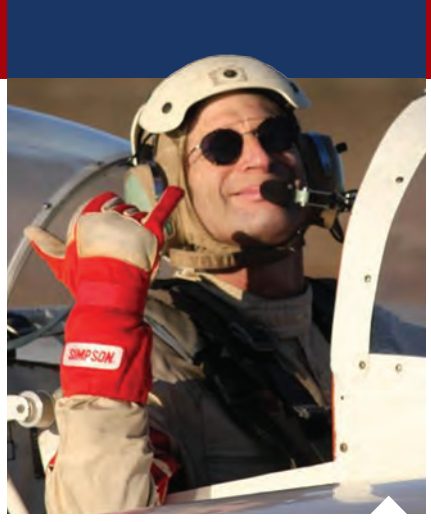
UNLIMITED POWER

PILOT		AIRPLANE	TOTAL		
★	Aaron McCartan	XtremeAir XA41 Sbach 300, N66XA	10448.44	80.43%	(1)

IAC

Threatening skies over MWAA.

Devin Graves is up as the second pilot for UND MWAA. Photography courtesy of UND Aerobatic Team



Here's What's Bugging Me

Confessions of a *g* junkie

BY TOM MYERS, IAC 16830

ONE OF THE ASPECTS of the sport that I love the most is that no matter how many contests I have flown in, I can count on every future contest to bring a new set of unexpected adventures. The 2023 Apple Valley Contest was no exception. What made this contest particularly poignant in that regard was that the unexpected was squarely in the realm of "you have got to be kidding me."

For many of us, the California we live in is a semiarid desert. We have two annual seasons: brown and green. California got a lot of rain this fall, winter, and spring. Off-the-charts massive quantities. It is mid-May as I write this, and we are still in green. The spring plant bloom was impressive. The ongoing spring insect bloom is beyond belief. So much so that I actually heard the smacks of several of the larger bugs that decorated the front of my canopy as they turned into Jackson Pollock splats during my flight home. This is with two layers of hearing protection on and a high-compression six-cylinder engine turning.

There were no noteworthy human-insect interactions on the first day of the contest. In hindsight, the situation was clearly a well-organized plot on the part of the insects to lull us humans into a false sense of security. It worked.

It took me multiple sessions to clean off the thick coating of bug hits from the outside of my airplane after flying back from the contest. What really makes this contest stand out was that I also had to clean off a multitude of bug hits from the inside of my airplane after flying back from the contest.

Apple Valley is located in the southern part of the Mojave Desert. Normally, there is not much wildlife running around the airport other than visiting aerobatic pilots. Tie down a bunch of brightly colored aerobatic aircraft at that airport, and guess what happens.

There were no noteworthy human-insect interactions on the first day of the contest. In hindsight, the situation was clearly a well-organized plot on the part of the insects to lull us humans into a false sense of security. It worked. As I walked across the ramp on the morning of the second day of the contest, I was thinking about flying my Unknown sequence, not about having to do battle with other airborne menaces in order to be able to fly that sequence.

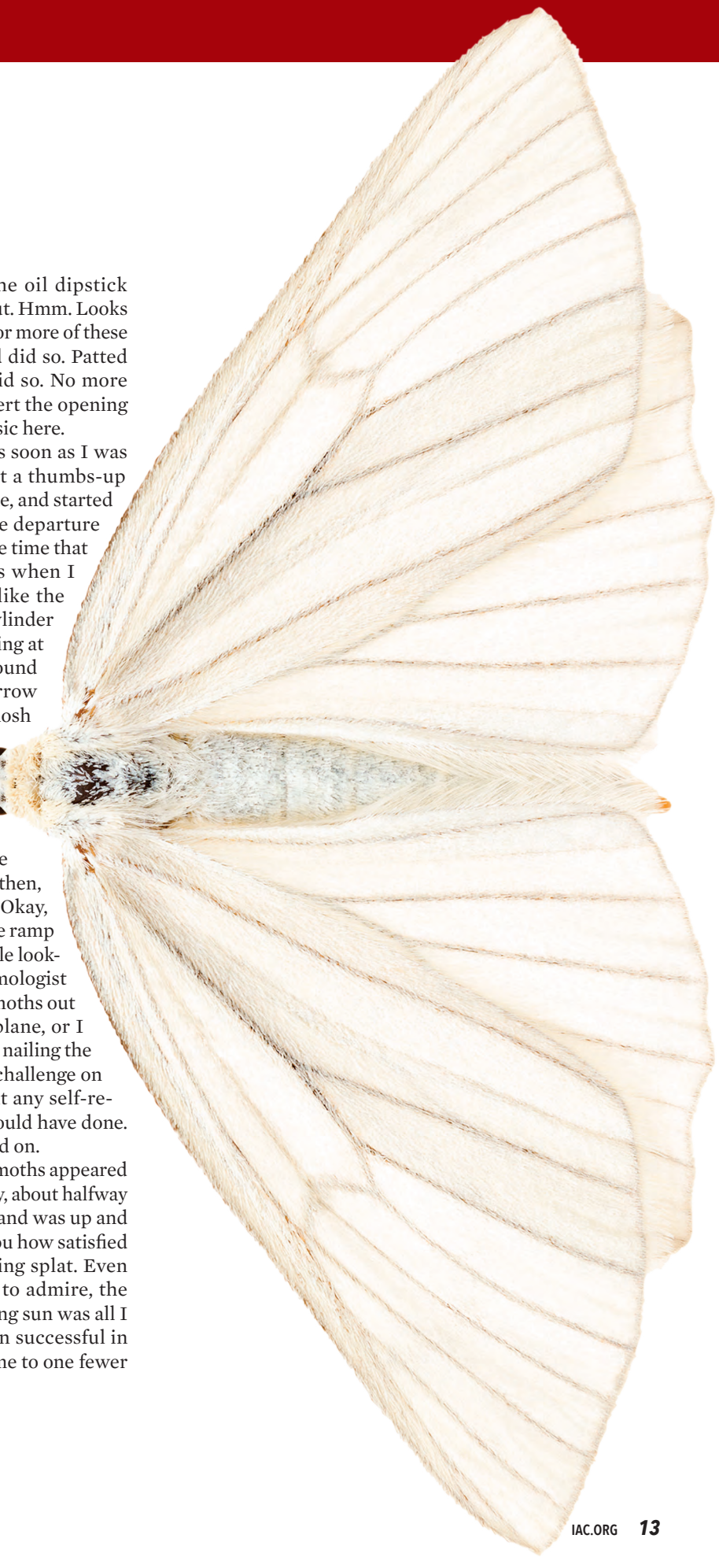
When I first opened the canopy, a moth flew out of the cockpit. Okay, no big deal. I guess it flew in sometime while I had the canopy open the

previous day. When I opened the oil dipstick access cover, another moth flew out. Hmm. Looks like I need to inspect the airplane for more of these things. I grabbed a flashlight and did so. Patted down the skins and fabric as I did so. No more moths. Okay, problem solved. Insert the opening notes of the *Jaws* movie shark music here.

I was the first pilot to fly, so as soon as I was strapped in and ready to go, I got a thumbs-up from the starter, fired up the engine, and started the long taxi from the ramp to the departure end of the active runway. About the time that I got onto the parallel taxiway is when I learned that moths really don't like the sound of high-compression six-cylinder engines, even when they are running at just over idle power. I suddenly found myself S-turning down a long narrow taxiway while looking through a mosh pit of amphetamine-fueled moths dancing to an industrial thrash band.

Once I got over my initial surprise, I realized there were "only" three of them, but in close quarters, it seemed like more. And then, just as suddenly, they were gone. Okay, decision time. I can taxi back to the ramp and hold up the whole contest while looking like some sort of crazed entomologist as I try to herd a swarm of manic moths out of the remote recesses of my airplane, or I could just deal with it and focus on nailing the sequence while ignoring a feeble challenge on the part of nature. Yes, I did what any self-respecting Type A aerobatic pilot would have done. I accepted the challenge and taxied on.

Not a moment later, one of the moths appeared on the right-hand side of the canopy, about halfway up. Without hesitating, my right hand was up and WHAP! I can't even begin to tell you how satisfied I was while looking at the resulting splat. Even though there was no moth body to admire, the fresh splat glistening in the morning sun was all I needed to confirm that I had been successful in assuring that the sky was now home to one fewer crazed Lepidoptera.



About the time that I got onto the parallel taxiway is when I learned that moths really don't like the sound of high-compression six-cylinder engines, even when they are running at just over idle power. I suddenly found myself S-turning down a long narrow taxiway while looking through a mosh pit of amphetamine-fueled moths dancing to an industrial thrash band.

It immediately occurred to me that the low morning sun shining through the canopy on my right side was by far the brightest light source in the airplane, and if I was patient and ready, I was likely to have an opportunity to deal with more of the hitchhikers. Sure enough, halfway down the taxiway, moth number two appeared in the same place that moth number one had appeared. WHAP! Two down; one to go. As I approached the run-up area, moth number three appeared, right on cue and location. WHAP! Three for three. I'm now over halfway to being a moth ace.

More importantly, though, my Unknown flight went just great. I even greased the landing, so I was all smiles as I taxied in. Now, of course, the sun was on my left-hand side as I did so. Sure enough, when a fourth moth appeared on the left-hand side of the canopy, I was not surprised, and it too got the WHAP! I taxied onto the ramp with matching bookend bug splats on both sides of the canopy. No lateral weight and balance issues here. No artistic symmetry issues either.

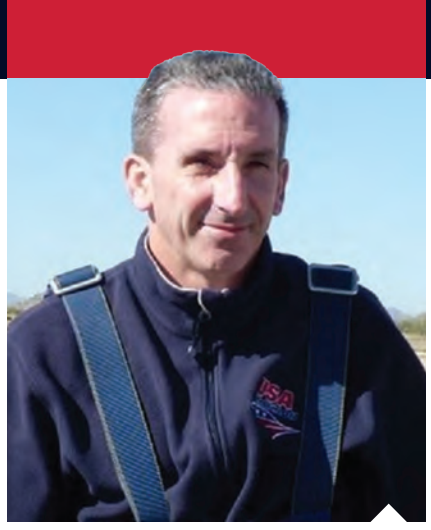
Once I had shut down and gotten out, I knew I had to address the task of extricating moth bodies from the airplane. I immediately found two but was unable to find any more at that time. I figured

that they would be easier to locate when I got home where I could shine a flashlight around in the background darkness of a hangar. That turned out to be true, and I found them both quickly. Please see the attached photos. Not too surprisingly, the moth coloring is not that different than that of the surrounding desert sand.

When everyone had finished flying, I started asking around to see if there were any other up-close-and-personal moth experiences. The answer was yes, there were several, and my experience was not even the most up close and personal.

That experience belongs to A.J. Wilder. A.J. had completed his wing waves and was diving into the box on a 45-degree downline and was about to pull level to begin his Unlimited Unknown sequence. That was when a moth landed at the bridge of his sunglasses on his nose. He could see one moth wing on his sunglasses with each eye. He had one hand on the stick and one hand on the throttle and was already committed to the sequence. He did what any self-respecting Type A aerobatic pilot would have done and accepted the challenge and dove on. While doing so, he stuck out his lower lip and started blowing hard breaths upward toward his nose until the moth flew away. He never saw the moth again and nailed his sequence. Booyah, A.J.!

Fly safe. *IAC*



The Most Modified Aerobatic Airplane

BY KEITH DOYNE, IAC 10545

WHEN YOU MENTION THE WORDS "Pitts Special," everyone immediately knows you are talking about an aerobatic biplane. This venerable biplane has been around a long time, with several production models and plansbuilt and kitbuilt models. The article titled "Various Pitts Models" on Page 60 of *Technical Tips Manual IV* will give you the quick rundown of the different versions of the famous biplane. Due to the date of the article, it doesn't list the S-2C, 1-11B, and Model 12 aircraft. As with any aerobatic aircraft, pilots and builders will always look to improve aircraft performance, and the Pitts Special biplane is no different. These modifications have included changes to the engine, propeller, wings, landing gear, cowling, canopy, rudder, and horizontal stabilizer. I will mainly look at modifications to the Pitts S-1 type aircraft.

Gordon Price's ultimate wing Pitts. IAC photo archives

One of the first modifications was to change engines to increase horsepower. Typically, the parallel-valve IO-360 was swapped out for the angle-valve IO-360. You gained about 20 hp and extra weight. The Pitts S-1S built by Bob Heuer and flown by Charlie Hillard to a World Aerobatic Championships title had the angle-valve IO-360. To further increase performance, several Pitts Specials were fitted with the parallel-valve IO-540 six-cylinder engine. With additional engine enhancements, the horsepower is increased even more. This moved the horsepower up to at least 260. However, the change to a six-cylinder engine necessitated several other modifications. In several instances, the numerous changes resulted in a new, one-of-a-kind airplane, which will be discussed later.

If you are looking at changing engines, then it is not surprising that the propeller would change, too. Metal or wood or composite fixed-pitch propellers with two or three blades. Some manufacturers will need information regarding your airplane and the kind of propeller — climb or cruise — to do

N442X is flown by Charlie Hillard, with Gene Soucy flying beside him. IAC photo archives

so. There are now composite, ground-adjustable aerobatic propellers available. Another choice is a variable-pitch propeller with metal or composite blades in two- or three-bladed configurations. These choices apply to both four- and six-cylinder aircraft. Cost, performance, and weight and balance considerations impact propeller selection.

Another area to improve performance is the wings on the aircraft. There are several different wings that are designed for the Pitts S-1 variants that will improve performance. These are stronger and heavier than stock Pitts Special wings. The ultimate wings were designed by Gordon Price back in the 1980s. For a good discussion of his wings, read the article titled "Some New Pitts Ideas" on Page 110 of *IAC Technical Tips Manual II*. The Falcon wings were designed by Kenny Blalock for his Falcon Pitts. Eventually, the plans were made available for builders to purchase. The Wolf wings, originally designed by Steve Wolf, can be purchased as complete wings or kits. Several current competition aircraft use one of these wing designs. There is a version of the Wolf wings available for the Pitts S-2S and S-1-11B models. Eddie Saurenman has also built custom wings for several highly modified, custom Pitts Specials.

Landing gear modifications started with Henry Haigh and his incorporation of spring landing gear on the Pitts S-1S. The focus was improved performance through a more

As with any aerobatic aircraft, pilots and builders will always look to improve aircraft performance, and the Pitts Special biplane is no different.

aerodynamically clean Pitts Special. This modification provided more performance than just changing to an angle-valve 200-hp engine. Many Pitts Specials have this modification. More recently, the rod-style or RV-style landing gear has been used on Pitts Specials. This modification requires a new engine mount, but it eliminates potential concern for cracks in the aircraft longeron with the spring landing gear. For even more performance, Henry Haigh designed, built, and flew the first Pitts Special with retractable landing gear. The only other retractable-gear Pitts Special that I know of was built by Ray Williams. More information regarding Ray Williams' creation can be found in the article titled "N300RW" on Page 42 of *IAC Technical Tips Manual IV*.

When you try to incorporate so many modifications into an aircraft, the easiest solution is to start with a clean sheet of paper and create a one-of-a-kind biplane. The most well-known examples are the Weeks Special and the Weeks Solution. The Weeks Special was a four-cylinder biplane, and it was then followed by the Weeks Solution, a six-cylinder biplane. Dan Rihn designed multiple unique biplanes for aerobatic competitors. The Sunbird, Goshawk, Phoenix, and Awesome Lady are examples of his work. The Sunbird, Goshawk, and Phoenix biplanes are six-cylinder engine designs, while Awesome Lady used an eight-cylinder engine. The article titled "Goshawk" on Page 6 of *IAC Technical Tips Manual IV* provides a good account of the development of this biplane. Each aircraft was designed to meet the individual desires of the owner in consultation with the builder. Harold Chappell built his biplane, which is featured in the article titled "N689HC" on Page 6 of *IAC Technical Tips Manual IV*. Even though he referred to this biplane as a Pitts S-1S, the numerous modifications really made it a unique biplane. Kenny Blaylock built his unique biplane called the Pitts Falcon, which led to the Falcon wings being available for Pitts Special S-1 aircraft. Jon Staudacher built the S260-2, which is based on the Pitts S-2B. This aircraft was featured in the September 1994 issue of *Sport Aerobatics*. Doug Dodge built several custom biplanes based on the Pitts Special design. The CoxHawk was built by Bobby Cox with design assistance from Dan Rihn and construction assistance from Doug Dodge. This aircraft is featured in the June 1995 edition of *EAA Sport Aviation* and was named 1995 SUN 'n FUN Grand Champion Plans-Built Homebuilt. If you want to include some custom air show biplanes, then Sean D. Tucker's

A 1999 Pitts S-1D. IAC photo archives

Justin Miller's Pitts S-1-11B. IAC photo archives

Oracle biplane, Skip Stewart's Prometheus biplane, Jim LeRoy's Bulldog biplane, and Rich Goodwin's Jet biplane come to mind. All done in pursuit of greater performance.

The Pitts Special is the most modified aerobatic aircraft in the IAC community. It is also the starting point for many unique biplanes that have graced the skies at aerobatic competitions and air shows. Curtis Pitts had a great design to start with, and others just improved upon it. The quest for the best-performing biplane continues.

Fly safe. IAC

VOLUNTEERING

A Way to Give Back

BY JORDAN ASHLEY, IAC 434846

EAA AIRVENTURE OSHKOSH, like contests, would not exist without a team of volunteers, forum presenters, and airplanes. Volunteering isn't about the individual. Volunteering is our way to give back to an organization and the things we care about. So, my desire was to create a series of awards given yearly to AirVenture volunteers by other AirVenture volunteers that, in some small way, would allow the organization to give back to its volunteers.

Chairman's Award — The AirVenture Chairman's Award was created to allow the IAC AirVenture convention chairman to recognize an individual for their work at AirVenture and as a way for the chair to publicly say thank you to them for a job well done.

This year's award goes to a volunteer who has spent every day in the IAC store. She greets members and visitors with equal enthusiasm. She goes out of her way to anticipate the needs of the store, other IAC volunteers, and customers with eagerness and kindness.

The atmosphere in the store was uplifted with her efforts. This year's Chairman's Award goes to Dita Nazifi, who traveled all the way from Melbourne, Australia, to volunteer with the IAC for the week.

Service Award — The AirVenture Service Award was created to recognize a volunteer who has gone above and beyond the call of duty in their service to the IAC and AirVenture.

This volunteer is helpful in many ways around the IAC building. Always asking how he can help and offering to tote and fetch. The service he provided this year was especially critical to the safety of some IAC members. With his expertise in the air show world and formation flying, he helped four individuals prepare for a four-ship photo shoot for the cover of *Sport Aerobatics*.

He attended the EAA pilot briefing and later met with the pilots to review safety procedures and signals they would need to have a safe flight in formation with the EAA photo ship.

We thank this year's Service Award recipient, Rob Holland, for sharing his knowledge and experience with our photo shoot pilots: Mel Williams, Greg Koontz, Jeff Granger, and Michael Lents.

AirVenture Forums Award — The AirVenture Forums Award, chosen by the AirVenture forums chair, was created to recognize a forum presenter who most contributes to the mission of the IAC with their presentation.

Tom Spratt

Nick Scholtes

This year's forums were outstanding and arguably the most well-attended forums in recent history. They were so good that our forum chair couldn't pick just one winner this year and elected to pick two instead. These forums stood out not only for the number of people they drew but also by engaging members of the aerobatic community that we do not ordinarily see. They embodied not only this year's AirVenture theme, "Safety, Grassroots & Homebuilt Aerobatics," but the mission of the IAC as well.

This year's Forums Award goes to Tom Spratt for his "RV Formation Flying" forum and to Nick Scholtes for his "Safely Exploring Aerobatics in Your Homebuilt" forum.

AirVenture Showplane Award — The AirVenture Showplane Award, chosen by the AirVenture parking chairman, was created to recognize an outstanding airplane or pilot who flew their airplane into AirVenture.

This year's Showplane Award goes to Mel Williams for his beautiful Bellanca Decathlon restoration (Bellanca Decathlon N719MW).

Mel not only has a beautiful airplane, but has taken to social media to share his love of aerobatics and the IAC with the masses as well. He is an ambassador for our sport, and now has a standout airplane that will certainly continue to serve our mission.

AirVenture Rising Star Award — Young people are the core of building a foundation of growth for the sustained future of the organization. The AirVenture Rising Star Award was created to recognize a student volunteer who has gone above and beyond the call of duty in their service to the IAC at AirVenture.

This young volunteer probably didn't know that she was volunteering with the IAC this week but is a good reminder to us that we are ambassadors of the sport and organization even when we are not physically tied to the IAC building. This volunteer became an aerobatic competitor before they could drive and spent the week of AirVenture promoting aerobatics by making new friends, to talk about aerobatics. One new friend even became a member this week as a result of her work.

This year's Rising Star Award goes to Samantha "Sparkle" Miner.

IAC


N327HR


Mark Meredith


IAC
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PHOTOGRAPHY BY **LORRIE PENNER** AND **ARIC KRAUSE**

GB1 GameBird Versus Extra NG

The buyer's perspective

BY JEFF GRANGER, IAC 19907

Jeff Granger with Walter Extra at EAA AirVenture Oshkosh 2019.

YOU'VE CASHED THAT CHECK from your Powerball winnings and paid off all your debts. Now it's time to get the aerobatic airplane you've always wanted. Maybe one of those new, all-composite monoplanes. But which one? The Extra NG or the GB1 GameBird? Maybe it would be good to talk to people who have recently been through the buying experience.

I first saw the NG at the rollout event at EAA AirVenture Oshkosh 2019. I was immediately impressed by the clean, angular lines, but even more so by the clean and functional cockpit layout. In a sharp contrast to my 1998 Extra 300L, the NG was built with a one-piece carbon fiber composite wing mounted to a steel tubing truss fuselage. Seated in my airplane (300L), I see tubes, wires, and rods going every which way. You don't dare drop anything, unless you want to spend half the day looking under the seat for it. Or worse, it could end up in the tail section where the elevator pushrod meets the horn.

The NG's instrument panel is clean and functional. The Garmin G3X Touch system eliminates most of the "round dials." Just a few of those remain for backup. Best of all, the front seat has a smaller duplicated flat-panel display. When doing a checkout for a new "Extra driver" seated in the rear of my 300L, one of my greatest sources of anxiety is that I have so little instrumentation when instructing from the front. There's no way to monitor the engine other than through constant verbal updates from the rear-seat pilot. There's no way to tune the radio. No way to monitor traffic unless I were to carry a separate iPad.

During the NG's 2019 rollout, I had a chance to talk engineer-to-engineer to Walter Extra about its design and development. For years he had contemplated going to an all-composite design to meet the challenges of the MX and GB1. Among the more difficult challenges he faced were providing adequate stiffness and durability while preserving failure modes that protected the crew compartment in the event of a crash. Carbon fiber composites are very light, stiff, and strong. However, when they do fail, they fail catastrophically — they don't yield gradually like a metal structure. He felt confident that they had overcome all these issues and that the next generation of Extras would build upon the aircraft's long tradition of quality, performance, and reliability.

That same year the Game Composites GB1 was on display in front of the IAC Aerobatic Center. I spoke to Philipp Steinbach and had a chance to compare and contrast these designs from opposite sides of the Atlantic.

The GB1 has more curving lines in the planform but a more angular stance in the side view, with its straight gear legs. Like the NG, it has flat-panel displays front and back, with the added bonus of propeller rpm and mixture control in the front seat greatly simplifying the checkout of new pilots.

I got my first chance to fly the NG at the U.S. National Aerobatic Championships in Salina, Kansas, in September 2021. I was not disappointed. With the help of the aircraft's "glass panels," and my previous experience in the Extra 200 and 300L, it was "get in and go." There was a lot of power with the Lycoming AEIO-580-B1A engine and the low-density altitude. (I usually fly out of Provo, Utah, at a pressure altitude of 4,164 feet and a density altitude of 5,293 feet.)

The cabin is super quiet compared with those of the earlier-model Extras. Stick forces are light to moderate in the traffic pattern and climb-out. While doing aerobatics, the big reveal comes as the roll force "breaks out" and becomes very light once the stick moves a few inches laterally, resulting in high roll rates with almost no stick resistance. In general, pitch-and-roll forces are well balanced. Landing was easy — probably easier than in any Extra I have flown, as it lands a little flatter.

Marcus Extra enjoys the great balanced harmony of the NG.

Last year at AirVenture, I had a chance to sit down with Marcus Extra and quiz him about the design, manufacture, and marketing of the NG three years after its debut.

MARCUS EXTRA

What do you say to the potential new customer? Perhaps someone who has already had an entry-level aerobatic airplane and wants to move up to something significantly faster and more powerful. They now have the financial wherewithal to buy the latest aerobatic monoplane. Why should they buy the NG instead of the GB1?

It's a really good-looking airplane. It was designed not just to be safe and a good performer. The build quality "fit and finish" is very high, not just for function but also for the aesthetics. The paint shop takes great pride in a seamless interface between different colors.

Extra has a long history of quality control in composite construction, which is so essential to the ultimate strength of the airframe. The bottom of the NG is the residual base frame. This provides an alternate pathway for load. The NG is even stronger and safer than the original steel tubing fuselage design.

The cockpit's ergonomics represent a big step up from the traditional Extra design. The seat is wide and contoured. The seat back and rudder pedals are adjustable. The clutter you find in the traditional Extra cockpit is gone. The autopilot is now certified. Fully fueled, its range is almost three and a half hours, so it's a great cross-country machine.

The front and back seats both have Garmin G3X touch-screen panels. The autopilot can be controlled from the Garmin. This is much simpler, lighter, and more reliable than the previous bulky and heavy panels with vacuum or electrically powered instruments.

It does not have an external baggage door like the GB1 or the Extra LT. This omission helps maintain the structural integrity of the fuselage. However, it's easy to reach the baggage area from within the rear cockpit.

As with all previous Extras, the aircraft is equipped with semicircular, single-piece fiberglass landing gear. It has a fair amount of fore and aft rigidity and doesn't create the sensation of "walking" that one sometimes encounters with tapered-rod gear legs. Extras have generally been easy aircraft to land compared with other tailwheel airplanes, and the NG is probably the easiest of all Extras to land.

When it comes to product support, most local mechanics can't do the composite repair work needed to correct something like a bird strike on the leading edge of the wing. Extra can send factory product support personnel to do composite repairs in the field, and Extra USA in DeLand, Florida, now provides product support in North America.

The aircraft has great control harmony that's balanced between pitch-and-roll forces. The aileron design provides a fair amount of stick-centering, which reduces fatigue for nonaerobatic flying and also makes for nice, crisp roll-stopping when flying aerobatics. The elevator and rudder are large, providing plenty of control authority even at slower airspeeds. It's easy to tumble and snap, so it can compete at any level, from Primary to Unlimited.

On the other hand, it can also be a great touring airplane for the noncompetitor — comfortable and fast while easily doing recreational aerobatics with low stick forces.

I recently spoke with Lee Drumheller, director for business development for Game Composites, and asked similar questions.

LEE DRUMHELLER

First and foremost, we have great customer service and parts availability with Game Composites LLC. Because of the factory support here in the United States, our customers receive excellent support and service in a timely manner.

We have a customer who took delivery of our GB1 No. 63. He has owned a couple Extras before. He came here, flew the GB1, and saw our factory. Then he went down to Florida, flew the NG, and came back and bought the GB1.

This customer plans on buying another GB1 based on his [assessment] that our airplane had a better fit and finish. It flew a little bit better with respect to its roll characteristics, but mostly he is able to get parts quickly.

Then there is the overall design — especially the feel and ergonomics of the cockpit. It seems to be a little bit bigger and more accommodating for a wider range of individuals than the NG.

The front seat has propeller and mixture control, and that's important, especially if you're going to do training such as competition or upset recovery. It's very helpful for the instructor in the front to have engine controls and instrumentation.

Not only is the GB1 capable of Unlimited category aerobatics, it's also a very comfortable cross-country airplane that travels at speed and has excellent baggage space. This airplane does a lot for the money. I get in and go 1,000 miles if I want; I can go 200 knots. I can throw stuff in the back. And it's really cool.

We had a customer come for GameFest, which is our social gathering here in Bentonville, Arkansas. He came from Santa Monica, California, nonstop in his GB1.

On the initial encounter, I usually have this conversation: "How much tailwheel time do you have?" And typically, given that we are 10 to 12 months from order to delivery, I will say, "During this next 10 months, I will get you set up with somebody who will give you your initial tailwheel instruction. You need to get time in the airplane. Learn how to dance with your feet on the rudders." Depending on what they've been flying before, the conversation may not include much discussion of tailwheel instruction.

We are building out a service center network and plan to have one service center on the West Coast, one in Florida, and an additional location on the East Coast. The Bentonville factory will serve the central United States, but we may consider a location in Dallas as well.

Service needs to be easily accessible if an owner wants to have an annual inspection or any major modifications done. Center personnel will provide expert carbon fiber composite repair and a network of certificated flight instructors who are checked out to teach in the GB1. These instructors can provide initial training, recurrent training, and ferry service.

Our email address is support@gamecomposites.com. All our customers are welcome to submit customer service requests and questions, and the emails will go to me, Kent, the engineering department, and our COO. It's important to us that our customers receive an answer — if not the same day, then within 24 hours.

Lee Drumheller emphasizes the factory support and excellent customer service provided by Game Composites.

Fortunately, I have several friends in the aerobatic community who have been through this decision process recently and have either purchased or are purchasing one of these aircraft. I interviewed two who chose the NG and two who opted for the GB1.

I asked them a number of questions, including what went into their decision process, which aircraft they had been flying previously, and how many other types of airplanes they'd considered. I also asked how important price was, how important the companies' product support track records were, and if company-supported events were important to them.

"I like the brand, which has a long history of quality and safety, "said Dagmar Kress.

DAGMAR KRESS

Dagmar Kress is a lecturer in the aviation and aerospace science department at Metropolitan State University of Denver, where she teaches theory of flight and aviation fundamentals. She also serves as the head coach for MSU Denver's aerobatic team, which she has led to three national IAC collegiate championships. Kress is an international world aerobatic competitor who has competed in world championships for both the United States and her native Germany. She flies a Pitts S-2B and an NG.

I have previously owned an Extra 300L and an Extra 330 SC. I did not look at the GB1. I am a loyal Extra customer. I like the brand, which has a long history of quality and safety. They have an established record of knowing how to build airplanes. I did get a ride from a friend in the GB1. It is quite different from the Extra. Although they are certainly both very nice airplanes, I fly the Extra better because I have a lot of time in the type. The GB1 seems to be more pitch-sensitive. I think I would have to fly it a good deal more in order to start flying it well. I would have to fly it from the rear seat as well, as my only experience is from the front seat.

I think the build quality of the NG is superior. I've never had an issue with structural integrity in one of mine. I don't have enough experience with the GB1 to comment on how it is built.

I think it comes down to personal preference. Based on my long experience with the Extras, I never really seriously considered the GB1.

The paint scheme on Dagmar Kress's Extra NG was designed by Mirco Pecorari and his daughter Federica Pecorari.

DOUG TRACY

Doug Tracy is an IT executive from Dallas. He graduated from the U.S. Naval Academy in 1982 and served in the U.S. Air Force from 1982 to 1996, flying the O-2A, RF-4C, and F-15E. He has owned and flown in competition an Extra 200, an Extra 300L, and a Super Decathlon. He currently competes in a GB1 in Sportsman.

After serving in the military, I started flying in Cessnas and got bored with that. I got a ride in the Extra 200, then a tailwheel checkout in a Super Decathlon, and eventually bought the 200. I upgraded to an Extra 300L and was enjoying it until I moved to the Washington, D.C., area. It's really difficult to do a lot of VFR flying around there, so I stopped flying for some time and then took it up again as I moved between California and Texas. I decided in Texas that I would get a Super Decathlon, but I missed having the faster, more maneuverable airplane. I decided to look around.

The new all carbon fiber composite airplanes were coming out: the NG and the GB1. I flew both airplanes and found that they are similar, but there are some distinctions. The decision came down to a few factors.

I went down to Southeast Aero and flew the NG with Doug Vayda, who had sold me my 300L. I flew the NG

When Doug flew down to Bentonville to test out the GB1, the good experience, price, and craftmanship won him over.

The GB1 GameBird comes with a 10.6-inch Garmin G3X Touch GDU 465 in the front cockpit.

The GB1 GameBird is designed by Philipp Steinbach, winner of the IAC's 2013 Curtis Pitts Memorial Trophy for his outstanding contribution to aerobatics through product design.

Richard Johnston has been flying his Extra NG in competition since 2022.

from the back seat and experienced everything the aircraft had to offer. It's a great airplane; I found that it was a natural fit for me.

A month later, I went to Bentonville and flew the GB1, which I initially found more difficult to fly. In comparison, the NG flew a lot like the Extra 300L and was similar in terms of handling and stick forces, etc. The GB1 was a bit different, and so it wasn't quite as easy for me to adapt to it. It took a little bit longer for me to get acclimated.

The handling characteristics were good. I think the GB1 had a longer range, but for me that wasn't really a big factor because, frankly, being in my 60s, I can't see myself sitting in the cockpit for five hours. The NG's range wasn't a factor. I did like the fact (and I don't understand why Extra didn't do this) that the GB1 has a baggage compartment door that was easy to access and similar to what was on the Extra 330LT.

In terms of flying and maneuverability, the NG was easier for me to pick up right away. It took a bit longer to get comfortable in the GB1, which was more pitch-sensitive. While getting acclimated to the GB1, there was a stiff learning curve in the landing phase, in making those last adjustments in the flare.

Regarding the fit and finish, both were nice. The build quality is very good in both.

Extra certainly has the longer track record as a manufacturer. Game Composites was still fairly new at the time, although the people involved with the GB1 had significant experience. Philipp Steinbach had designed his own airplane, the Sbach, in the United Kingdom. He worked for Extra for a bit before designing the GB1.

While I was looking, the GB1 was FAA-certified and NG was in the process of getting its certification, which came a bit later. That was important to me.

When the aircraft were similarly configured, the price for the NG was about $100,000 more than for the GB1. For some people that might not be a factor, but for me at the time it certainly was. So I could have a new GB1 for 80 percent of what I would pay for the new NG. Since then, both the NGs and the GameBirds have gone up in price to the point that they're now pretty close.

Another factor I considered was my proximity to factory support at Bentonville, Arkansas, because you didn't have the long supply chain coming from Germany. I can get to Game Composites in 80 minutes flying the airplane up there, which is nice. That

said, when it came to the Extras I owned, Southeast Aero always gave me great support.

In the end, although I liked their track record and the length of time that Extra had been in business, the price difference was too much for me to ignore. Also, the owner experience with Game Composites was better than what I experienced with Extra. Game Composites has set up an owners forum, where I recently saw there'd been an issue with crankshaft seals leaking. Based on information shared on the forum, I contacted the factory, and they fixed it at no cost.

In addition to the owners forum, the company now hosts an event called GameFest. At the last event, there was a lot of discussion about the airplane and where they're going as a company. Owners were able to meet each other, and there was also some fun flying and other activities.

I recently had to take the airplane back to the factory for some work on the smoke system. When I arrived around noon, I had a lousy landing. Philipp talked to the company's instructor pilot and said, "Why don't you take Doug up right now and get some landing practice?" No charge to me. As a whole, Game Composites thinks a lot about the owner experience. How can we make it better? How can we try to make it safer for people?

Recently, one of the owners lost a GB1 canopy, which may not have been fully latched. The company upgraded the customer's aircraft with a free warning light that shows if the canopy is not fully locked.

RICHARD JOHNSTON

Richard Johnston is a businessman from Pleasant Grove, Utah. He competes in Sportsman in the NG and flies a Cessna 340. He has previously owned an Extra 300L and a 330LT.

It was mostly a gut feeling. I had already owned two Extras — the 300L and the 330LT. The 300L had great performance. The 330LT cornered better and drew straight lines much better because of the asymmetric wing, but it was missing performance characteristics like the roll rate. I didn't want to go back to the lower power of the 300L. If I was going to purchase a newer airplane, I figured it would be the NG. With respect to price, it was only a small jump to go to the NG versus the 330LX. I also liked the self-centering feature on the NG's ailerons. It sure stops!

I have never owned a Pitts or a Decathlon, although I trained initially on the Decathlon. It's a neat airplane, but my biggest concern was I'd break it. I want to stick with a carbon fiber wing.

The 330LT was super fast, really slippery, and handled higher altitudes a lot better. The NG makes up for it to some degree, but it's not quite as fast as that LT, which had less angle of attack in cruise, so it really slipped through the air.

The NG's luggage capacity is horrible compared to the others'. There's a small luggage compartment in the back, and I found out on the first flight that you can't have anything back there or it interferes with the magnetometer. The LT has a baggage door, and I had this big

Richard Johnston flies his Extra NG out of Utah to Southwest and South Central regional contests.

duffel bag that would slide in at an angle so you could put a ton of stuff in there.

I flew in the GB1 just once, as a passenger. I think it flies well from the front seat. One of the features that people like is that you have full prop and mixture controls in the front seat, along with the full engine monitoring, radio, and everything else. Of course, the NG and the GB1 are pretty similar in that respect, because they both use the G3X Touch system, but the main difference is the NG doesn't have prop or mixture in the front seat, which could be kind of a disappointment, especially when it comes to instruction.

In terms of handling, the NG is a lot more responsive than the GB1. It seemed to stop faster and center more easily.

Extra has a long track record for manufacturing quality aircraft and providing top product support. That's really why I went with them. Both airplanes are new enough that I knew there could be some hiccups.

The NG and the GB1 are relatively newer types, but Extra has the legacy behind it, relying on the same group of engineers who have designed Extras from the beginning.

I think designers relied a little bit on their older designs to create the newer design. If you look at the wing shape, the GB1 probably has the more efficient wing, and the GB1 is very attractive, especially with the taller gear on it. I think it's a really neat-looking airplane. It's got that wing that has kind of a curved sweep to it, whereas the NG is blockier.

Joe McMurray

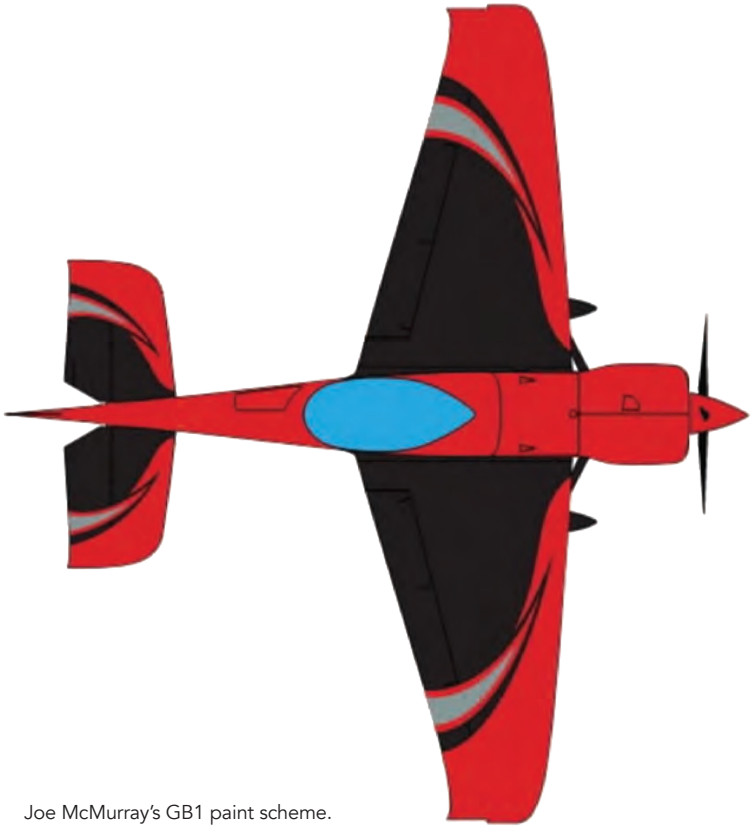
Regarding company-sponsored events for the owners, I don't know that it's super important. I'm in a chat group for NG owners. We share information back and forth and figure things out. I have my own aviation community here in Utah.

JOE MCMURRAY

Dr. Joe McMurray is a practicing board-certified oral and maxillofacial surgeon. He has owned a 1999 Beechcraft Bonanza A36, a 2012 Carbon Cub, and a 2020 Super Decathlon. With over 5,000 hours, he holds ATP, IFR, COM, SES, and CFI certificates and ratings. He's awaiting delivery of his 2023 GB1 serial No. 78 in September 2023.

With any airplane I've owned, the question has been "What is my mission?" If my mission was to fly Advanced or Unlimited and make the U.S. National Aerobatic Team in those categories, I would be hard-pressed not to purchase either a 330SC or MX. Both ships have been proven on the national and international stage. That wasn't my mission or goal as I set out looking for an aerobatic airplane.

I started my research and compared and contrasted the two certified two-place aerobatic airplanes, the GB1 and NG, and it came down to:



Joe McMurray's GB1 paint scheme.

1. Emotional and visual appeal
2. Comfort
3. Performance and speed
4. Aerodynamic features
5. Fuel tank size
6. Cross-country capability

I wasn't dogmatic, nor do I have an unwavering loyalty to one particular manufacturer. The biggest decision process involved ramp appeal. Of course, beauty is subjective, but this design caught my eye. I love the way the GB1 looks; Philipp Steinbach's designs are works of art. The GB1 is more curvaceous than the NG, which in my opinion appears very angular and blocky.

How does it feel sitting in there? For my body type — I'm 6 feet, 4 inches tall, 245 pounds, and have a 37-inch inseam and 26-inch-wide shoulders — the NG was a snug fit compared to the GB1. The GB1 provides more legroom, more headroom, a bit more shoulder room, and better visibility, with a more elevated seating position and the lower cowling.

The throttle position in the GB1 is better suited for me as well.

Most aerobatic airplanes are spartanly dressed out with chromoly steel tube on the interior. The GB1 was one of the first 100 percent carbon fiber-built airplanes with an enclosed monocoque design.

The GB1 carries more fuel than my Bonanza A36 (81 gallons total, including 25 gallons in the acro tank) and has a range of more than 1,000 miles. It also has a separate, 35-pound enclosed baggage compartment with an external access door.

Many of the high-performance aerobatic airplanes are single-seat and are not built to fly long distances. However, I feel there is a demographic out there that demands long-distance possibilities, Unlimited capabilities, and comfort. Game Composites was the first to answer that call. It checks

Joe McMurray goes vertical in the GB1, fits his 6-foot, 4-inch body with all the room he needs.

all the boxes when it comes to performing in competition at the highest level. But it also has many of the creature comforts that I appreciate and expect when flying for recreational purposes.

In conducting these interviews, I deliberately maintained a neutral position. I wasn't looking to declare a "winner," because I don't think that's the point. The perspectives of the two product representatives and the four buyers are presented here to help you determine which aircraft aligns with your own desires and needs should you be in the market. Both aircraft are well made and excellent performers. Brand loyalty, a desire to buy a domestic product, flight handling, and cross-country travel amenities are all factors that hit buyers differently.

The greatest surprise for me while assembling this article was that the buyers each had their own biases from the outset. Few aerobatic aircraft buyers enter this process with a perfectly objective outlook. If you're fortunate enough to be able to afford one of these fine aircraft, it would be hard to go wrong with either purchase.

Apparently, I'm not the only one in a quandary when it comes to choosing between these two highly capable composite monoplanes. In episode 108 of their aerobatic podcast Fly Cool Shit*, Mark Pollard and Jeff Petrocelli made some excellent points about the pros and cons of these aircraft and the potential market. Many of the potential buyers are relative newbies in the aerobatic community. They may not have gone through the traditional, gradual steps of aircraft ownership, which often include purchasing a Super Decathlon or Pitts. The new buyer is successful and likes the aerobatic scene, but is not immersed in the history of aerobatic airplanes. In the past, this person might have bought a fast car to take to the racetrack. Now they want to fly. They enjoy high-performance sport flying and aerobatics.*

This prospective NG/GB1 buyer wants to be able to do recreational aerobatics, including snap-rolls, and maybe participate in an occasional contest. These airplanes are fun and go fast. They can do that safely without getting overstressed. And they are more comfortable and easier to land than a Pitts.

These buyers are not world competitors or air show performers. In the near term, the Unlimited category will likely continue to be dominated by single-seat monoplanes like the MXS and particularly the Extra 330SC. In this sense, Extra has definitely cemented its place in aviation history. Experienced,

In the GameBird "shop."

high-level aerobatic competitors are too rare to make up the primary market for these new monoplanes. That part of the market would be rapidly sated by the aircraft's high production rate.

The market for high-performance monoplanes was previously dominated by Extra, and the buyers were very experienced with the sport and the market. The seller did not have to do much marketing. Now there is a new class of buyers.

The differences between the NG and the GB1 are small enough that customer support and factory-sponsored events may be deciding factors for some new customers. Proper maintenance and parts availability are especially important for new owners who don't have a local mechanic who has deep experience with aerobatic airplanes.

Game Composites is based in the United States and has strong financial support from the Walton family (of Walmart/Sam's Club fame). Factory tours are available that can greatly influence a buyer's choice. Buyers may be very emotionally invested and like entering an ecosystem or collective where they can associate with people with mutual interests. Game Composites hosts GameFest events to build the ownership experience.

Jeff Granger

In coming years, these airplanes will be very attractive to the flight schools that do upset prevention and recovery training and spin training. This is a huge and growing market that specially caters to airlines and corporate flight departments. With luck, this will build a secondary market for affordable used airplanes.

Don't forget to buy that Powerball ticket! IAC

Grayout During an Aerobatic Competition

My personal experience

BY JOE MCMURRAY, IAC 441329

I THOUGHT I HAD all the skills and knowledge needed to compete. But during the Hammerhead Roundup in Borrego Springs, California, I learned a valuable lesson the hard way.

It was the second flight of what was a very long day. Figure 7 and Figure 8 of my Free: I was performing a vertical upline layout inverted followed by a half-loop down, and I made a crucial mistake.[F1] I inhaled deeply and forced pressure into my ears to clear them. The next thing I knew, I was seeing stars, having recovered but hard zeroing my last three figures.

It wasn't until later that I realized what had happened. The intense *g*-forces, going from *inverted zero g to +6g*, I had subjected my body to during that maneuver caused me to grayout. It was a humbling experience, to say the least. As a seasoned pilot, I had trained for months for this competition and felt like I was in control at all times. But in that moment, I had lost control.

Despite the momentary grayout, I flew through my last figures with a hard zero, determined to finish the competition. And while I didn't place as high as I had hoped for that flight, the experience taught me

some valuable lessons that I'd like to share.

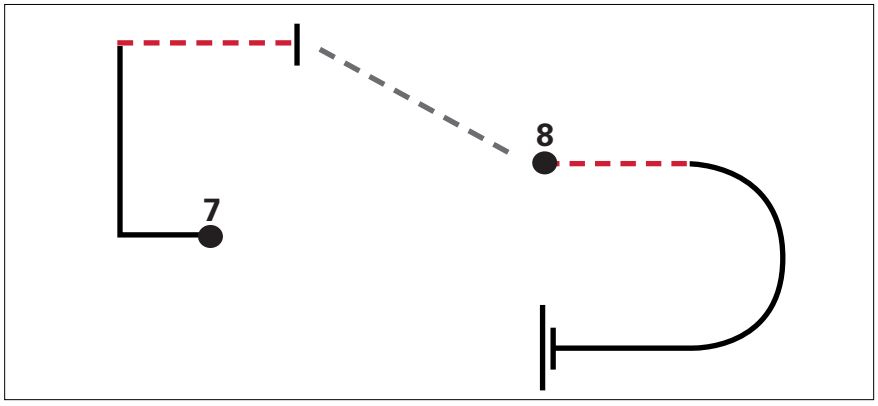
Looking back, I realize now there were a few factors that contributed to my grayout. It was an extremely hot day (103 degrees F), I had been volunteering as an assistant judge for several hours, and I failed to hydrate adequately and eat. Not to mention I had been in the aerobatic hold for quite some time before I was cleared to enter the box. A typical day of competition (for me or any high-energy super volunteer in California).

Let's review two terms — **G-LOC** and **grayout** — that both relate to the effects of high *g*-forces on the body.

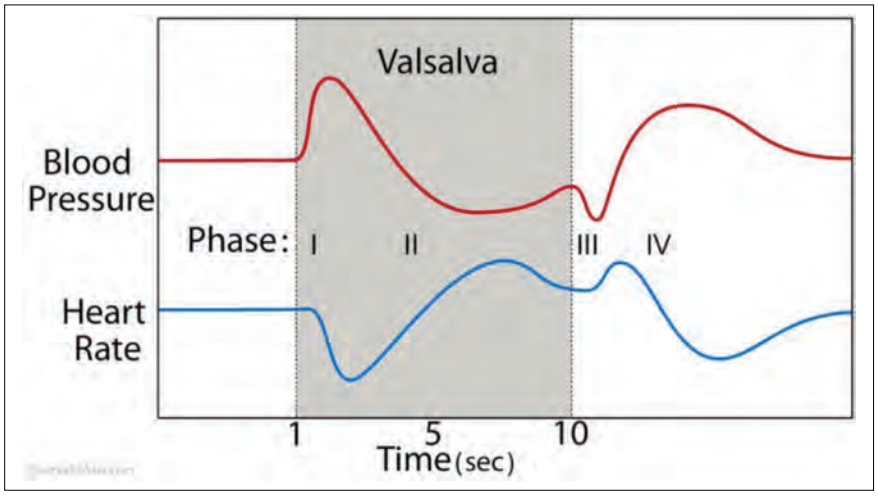
G-LOC, or *g*-induced loss of consciousness, occurs when a pilot is subjected to a rapid onset of high *g*-forces and loses consciousness as a result. This can happen when a pilot pulls too many *g*'s during a maneuver, causing blood to be forced away from the brain and into the lower extremities. When this happens, the pilot may experience a blackout, in which they lose consciousness and are unable to continue flying the aircraft.

Grayout, on the other hand, is a milder form of *g*-induced impairment in which the pilot experiences a reduction in blood flow to the brain, causing their vision to become blurry or grayed out. While a pilot experiencing a grayout may be able to continue flying the aircraft, they may not be able to see clearly or make accurate judgments about their surroundings.

To avoid G-LOC and grayout, pilots must take steps to manage their *g*-forces. This includes practicing proper breathing techniques. One technique used to manage *g*-forces is the **hook maneuver**, which involves contracting the muscles in the legs and abdomen to increase blood flow to the brain. Additionally, it is important to stay hydrated, as dehydration can increase the risk of *g*-induced impairment. Pilots must also be aware of their body's limits and take (explicit) breaks when necessary to avoid fatigue and stress.



[While] performing a vertical upline layout inverted followed by a half-loop down, I made a crucial mistake. I inhaled deeply and forced pressure into my ears to clear them. The next thing I knew, I was seeing stars.



When a pilot performs a Valsalva maneuver while under high *g*-forces, you can see a sudden drop in blood pressure at about 10 seconds, leading to a blackout or grayout.

Competition days are often long and grueling, and it's important to take care of yourself. Hydrate, eat, and rest when you can. Also, listen to your body and be aware of the signs of fatigue and stress.

Fly often and fly safe! IAC

Dr. Joe McMurray is a board-certified oral and maxillofacial surgeon. His certificates and ratings include ATP, CFI, IFR, COM, and SES with more than 5,000-plus hours of flight time. He currently competes in Sportsman in his 2020 Super Decathlon and looks forward to competing in the Intermediate category next year in his newly acquired GB1.

[F1] One maneuver that can increase the risk of both **G-LOC** and **grayout** is the **Valsalva maneuver**. This is a technique in which a person forcibly exhales while keeping their mouth and nose closed, which increases pressure in the chest and can help to equalize pressure in the ears. However, when a pilot performs a Valsalva maneuver while under high *g*-forces, it can cause a sudden drop in blood pressure, leading to a blackout or grayout.

Flying the Competition Aileron Roll

BY GORDON PENNER, IAC 429704, FAA GOLD SEAL CFI, THREE-TIME MCFI-AEROBATIC, PAST PRESIDENT IAC CHAPTER 34 (OHIO), B-767 CAPTAIN, SAFE BRONZE MEMBER

The Competition Aileron Roll

COMPETITION AILERON ROLLS, which are really slow rolls in technique, are one of the harder things to teach in the basic aerobatic course. You must *not* pitch first before initiating the roll as you would in a pure, 1*g*, Bob Hoover-smooth, *coordinated* aileron roll (or the zero *g* Primary roll). A slow roll is definitely *not* coordinated because top rudder, or sky rudder, is applied in each knife-edge portion of the roll.

Low-horsepower/high-drag airplanes struggle with the slow roll unless it is flown at moderate to high airspeeds. Enter the roll as fast as you can.

The main problem in this maneuver is that people do not maintain the straight and level path before, during, and after the roll. Sinking during the roll is quite common, especially in the inverted and second knife-edge portions of the roll. Another problem is not maintaining a constant roll rate. Most pilots allow the roll rate to speed up in the second half of the roll.

People also end up off heading, usually to the right in a left roll.

The key to a good competition aileron (slow) roll is picking a spot on the horizon, and then drawing Alan Cassidy's sacred circle with the tip of the nose around that spot. John Morrissey's "deep focus" must be maintained throughout the roll, which will be a challenge in and of itself as the controls are manipulated.

If we consider a left roll, the tip of the nose starts at 6 o'clock on the sacred circle, rotates counterclockwise up to 3 o'clock for the first knife-edge, continues up to the 12 o'clock when inverted, down to 9 o'clock for the second knife-edge, and then back to 6 o'clock. The controls must be manipulated in such a way to "draw" that sacred circle with the tip of the nose around that point on the horizon.

Remember our earlier conversation from Rich Stowell about pitch and yaw? That will apply here.

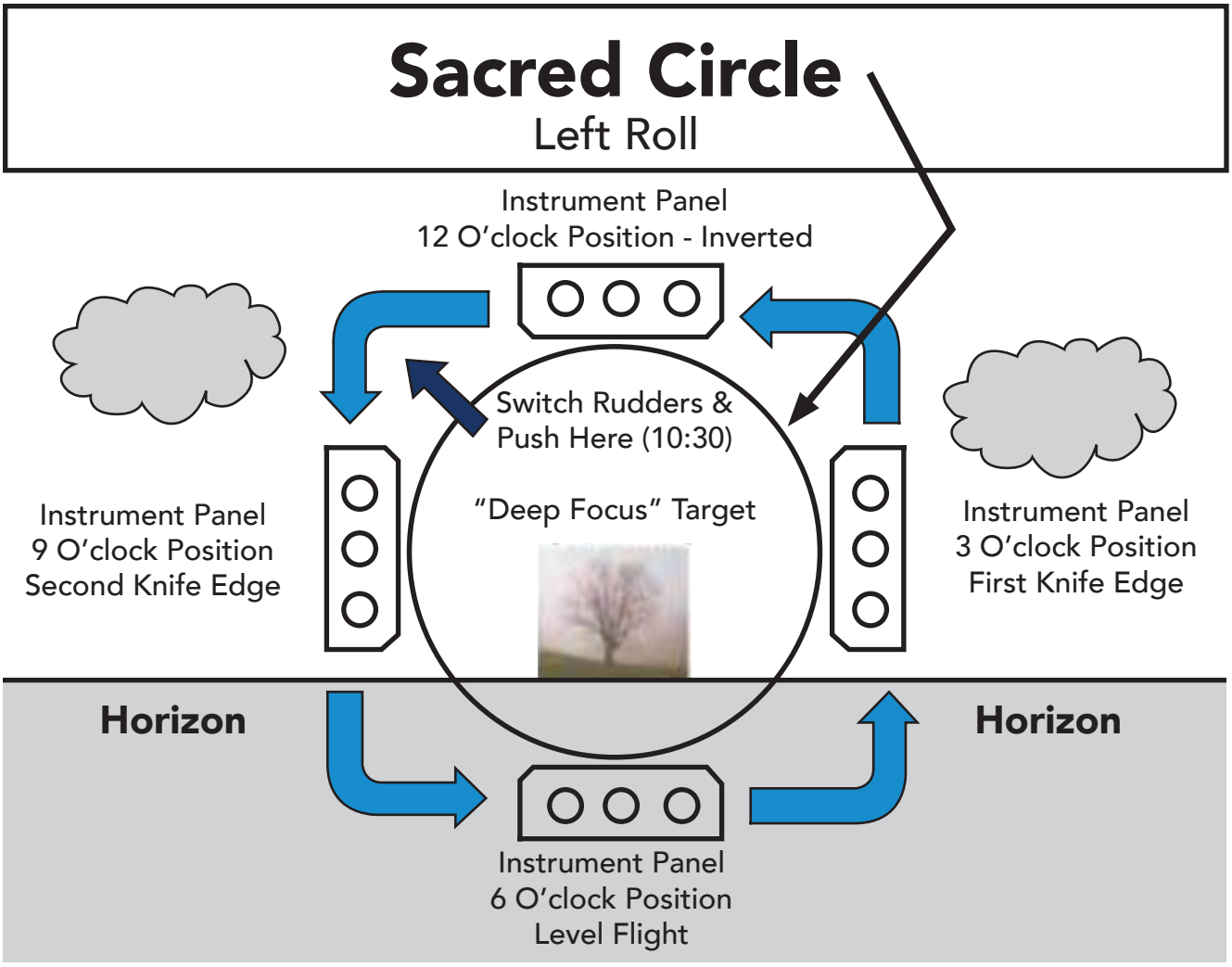
Former flight instructor of the year and Master CFI-Aerobatic Rich Stowell said it best. He stated that the flight controls work in relation to the pilot not the horizon. Pitch is a head-to-foot motion of the tip of the nose of the airplane, not up and down. Yaw is an ear-to-ear motion of the tip of the nose of the airplane, not left and right. Up and down and left and right, in relation to the horizon, only work in upright flight with less than 40 degrees of bank. Up and down and left and right ideas do not work in knife-edge or inverted flight.

Sport Aerobatics, May 2018

Some airplanes need a higher nose attitude when inverted at the 12 o'clock

The 1*g* or 0*g* "Bob Hoover" aileron roll.

Competition aileron (slow) roll.



Alan Cassidy's sacred circle.

position on the sacred circle. That makes the sacred circle tall at the 12 o'clock point, which is why I sometimes call the sacred circle the "sacred egg." To find this 12 o'clock attitude, the pilot must first fly inverted at different speeds to see how high the nose has to be above the horizon while holding an altitude.

When rolling past 3 o'clock on the sacred circle on the way to 12 o'clock, there must be enough push added to get the nose up to the correct inverted attitude. Blend this push in between 3 o'clock and 12 o'clock.

Enough knife-edge practice must be flown to determine how much top rudder must be held to maintain altitude at the selected speeds. Since an aircraft in a slow roll is basically in a slip from before the first knife-edge until past inverted (left aileron for the roll and right rudder for "top" rudder), it is losing energy throughout.

A good trick taught to me by Emerson Stewart here in Ohio was to not switch the rudders (when switching to the other top rudder) when passing through 12 o'clock, but to wait until about the 10:30 position.

Additionally, as it says in Alan Cassidy's book *Better Aerobatics*, a little push with the elevator at about the same time as the feet are switched (10:30 position) will also keep the nose pointed in the right direction as the rolling motion continues, rounding out the second half of the sacred circle. This push will fix the problem of ending off heading to the right all the time.

Once the rudder pedals are switched, the roll rate will increase, which is a downgrade. This happens because once the pilot shifts to the left rudder for "top" rudder, the aircraft is no longer slipping. Ease off the aileron deflection a bit when the rudder pedals are switched so the roll rate stays the same.

Fly safe! IAC

A Look Back at Clint McHenry

BY MIKE HEUER, IAC 4

Clint McHenry presents Mike Heuer with the Frank Price Cup in Oshkosh in 1984.

AS WE GO THROUGH life, we have people step in along the way who have an enormous effect on us and can guide us in many ways. They can be friends, teachers, coaches, and mentors of all types, in addition to those family members who are such an important part and set the stage for us when we are young.

I have been involved in aerobatics my entire adult life, with the first aerobatic contest I witnessed being in 1965 in Ottumwa, Iowa, when I was 15. Since then, the IAC was formed in 1970 and brought me in touch with hundreds of people. Even then, some really stood out.

One of these was Clint McHenry.

I was sorry to hear of his passing earlier this year. I had met Clint back in the 1970s when we crossed paths at various aerobatic championships and became friends. He was deeply devoted to the sport — not only as a pilot, including his time on the U.S. Aerobatic Team, but also as a leader and a volunteer. He was interested in and dedicated to the development of the sport and served as our country's CIVA delegate before I took on those responsibilities in 1984. He also served on both the IAC's and CIVA's rules committees. Aside from those accomplishments, he was a wonderful, friendly, courteous, and warm human being you were always glad to see and who always had a good word.

A captain for Eastern Air Lines, Clint joined the IAC in the first year and held membership No. 843. He moved up in the contest ranks quickly and earned himself a spot on the U.S. Aerobatic Team in 1976 and competed in Kiev, USSR, that year. He regaled us with his stories of traveling into the USSR after the airplanes were shipped to Europe

PHOTOGRAPHY COURTESY OF **IAC ARCHIVES**

The 1976 U.S. Aerobatic Team.

on a Lufthansa cargo airplane and assembled there and flown to Hungary and then on to Kiev.

It was the height of the Cold War with the World Aerobatic Championships (WAC) probably being the worst and most tilted in aerobatic history. It was that contest that thrust Clint into CIVA work as well as his lifelong support for the statistical system of scoring that resulted from the debacle at the 1976 WAC. In 1976 and prior, "averaging" was used and easily manipulated. The new system was implemented to eliminate judging bias in the calculation of scores. Without CIVA agreeing to the introduction of this new scoring system, which we called the Bauer system (named after one of its authors, Hans Bauer) in 1978, aerobatic championships at the world level may not have survived. Clint

The 1977 IAC board. Top row: Don Taylor, Bob Heuer, Clint McHenry, Jim Lacey, Harold Neumann (directors). Bottom row: Mike Heuer (treasurer), Carl Bury (vice president), and Verne Jobst (president), Trish Morris (secretary).

At Pompano Air Center. Standing second from the left is Clint McHenry.

understood the new system, backward and forward, and advocated for its improvement over the years.

The U.S. Aerobatic Team persevered in Kiev, and Clint came in 14th that year in his Pitts N82CM. He went on to fly at the WAC in his Extra 230 N230X in 1986 and 1988 and his Extra 300 N540CM in 1990. He also served as the team trainer in 1978 and 1982, on the FAI International Jury in 1984, and as a judge in 1994. He was U.S. National Aerobatic Champion and winner of the Mike Murphy Cup in 1986, 1987, and 1989.

Of course, these were the outstanding accomplishments of a man who had a love of aviation since he was a boy growing up in Pennsylvania and Virginia. But beyond that dedication and devotion, there stood a man who wanted our sport to grow, prosper, and be safe — at the grassroots level as well as in international competition, and he worked hard for that.

Shown are Unlimited champion Clint McHenry (center), second place Alan Bush (left), and third place Leo Loudenslager (right).

PHOTOGRAPHY COURTESY OF **IAC ARCHIVES**

The 1986 U.S. Aerobatic Team.

For many years he served as an instructor at Pompano Air Center in Pompano Beach, Florida, a business run by John and Brian Becker, and was active in local IAC chapters in Florida. He brought many pilots into aerobatics, and that legacy lives on today.

He also mentored me, as a pilot and as an IAC officer and representative at CIVA. I can well remember that first trip to Paris, France, in 1984 when Clint asked me to sit in for him at the CIVA rules committee meeting that year, chaired by Werner Garitz of East Germany. It was an intimidating time for me, working with people I had heard of but had not yet met, and Clint's guidance in addition to that of his predecessor, Charlie Hillard, helped me through it. I became the United States delegate after that and then CIVA president in 1986.

I will never forget a couple of trips we made with Clint and his wife, Marcia, after CIVA meetings. They were a delight to travel with as we cruised around Austria, Germany, and western Ireland in those years. I do remember Marcia wanting to see the Cliffs of Moher in Ireland, which we did, between wonderful meals and conversations together.

One photo I treasure is of Clint and me together when he was tasked with presenting me with the Frank Price Cup in 1984 at a meeting in Oshkosh (see Page 42). There is much more information on Clint on the IAC website's Hall of Fame page. I urge members to read it as it is a fascinating biography (IAC.org/node/1116).

Clint passed away at the age of 96, but he lives forever with those of us who knew and loved him. ***IAC***

The Extra 230 Clint flew at the WAC from 1986 to 1988.

2023 IAC CONTEST SEASON CALENDAR

MSU at the Clyde Cable in Lamar, Colorado

Akrofest in Borrego Springs, California

USAF Academy at the Clyde Cable in Lamar

IAC.org/Contests

DATES	HOST CHAPTER	NAME	REGION	LOCATION	AIRPORT
September 24, 2023		U.S. National Aerobatic Championships	South Central	Salina, KS	KSLN
October 7, 2023	5	Clyde Cable Rocky Mountain Aerobatic Contest	South Central	Lamar, CO	KLAA
October 13, 2023	36	Akrofest 2023	Southwest	Borrego Springs, CA	L08
December 7, 2023	23	86th Sebring Championship	Southeast	Sebring, FL	KSEF

FLYMART

BOOKS

"To Look Upward: One Flight Instructor's Journey," Rob Mixon, Amazon

EAA AirVenture Oshkosh 2023. Photography by Laurie Goossens

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